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Tsuneo Maki

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EXAMINER

WALSH, RYAN D

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/532,852	Applicant(s) MAKI ET AL.	
	Examiner RYAN D. WALSH	Art Unit 2852	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-25, 27 and 28 is/are rejected.
- 7) ☒ Claim(s) 12 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 14-16 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Abe (US Pub. # 2002/0085864).

Regarding claims 1 and 15, Abe teaches, “ (Image forming apparatus) A belt conveyance apparatus comprising: a drive roller (Fig. 3A, ref. # 10); a driven roller (20) rotating in accordance with an operation of the drive roller; a conveyance belt (30) engaged with the drive roller for rotationally driving the conveyance belt and the driven roller, the conveyance belt being provided with a first bead and a second bead formed on an inner side thereof (Fig. 9, ref. #'s 32L & 32R); and driven roller support means (Fig. 3A, ref. # 70, paragraph's [0140-0147]) for rotatably supporting the driven roller, the driven roller support means being configured to allow the driven roller to move in a thrust direction, wherein, in operation, ends of the drive roller and the driven roller interface with the first bead and second bead of the conveyance belt so as to allow and restrict a deflection of the conveyance belt in the thrust direction, and the driven roller is movable in the thrust direction according to a deflection of the conveyance belt (Fig. 9 & [0180].”

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Regarding claims 2 and 16, Abe teaches, "wherein the first and second beads are formed on each side of the conveyance belt in a direction of width thereof, and a clearance between a first end of the driven roller and the driven roller support means on a side of the first end of the driven roller is greater than a sum of a first clearance between a second end of the driven roller and the second bead which is located on a side of the second end of the driven roller, a second clearance between a first end of the drive roller and the first bead which is located on a side of the first end of the drive roller, and a third clearance between a second end of the drive roller and the second bead which is located on a side of the second end of the drive roller (see Fig. 3a and Fig. 9)."

Regarding claims 14 and 28, Abe teaches, "pressing means for pressing the conveyance belt to the drive roller, wherein the pressing means is located at a position opposite to the drive roller with the conveyance belt interposed therebetween (Fig. 4, ref. # 66)."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (US Pub. # 2002/0085864) in view of Kurokawa et al. (US Pat. # 5,873,016), hereinafter referred to as Kurokawa.

Regarding claims 3 and 17, Abe does not appear to teach, "wherein at least one of the first bead and second bead is provided on an inner side of the conveyance belt, and a groove is formed on a circumferential surface of the drive roller so that the at least one of the first bead and second bead is brought into engagement with the groove." However, Kurokawa teaches the deficiencies of Abe (see Fig. 1A, ref. # 65'). It would have been obvious to one skilled in the art at the time the invention was made to modify Abe's invention to include wherein at least one of the first bead and second bead is provided on an inner side of the conveyance belt, and a groove is formed on a circumferential surface of the drive roller so that the at least one of the first bead and second bead is brought into engagement with the groove.

The ordinary artisan would have been motivated to modify Abe's invention for at least the purpose of preventing the belt from moving off track and causing faulty images.

Claims 4, 5, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (US Pub. # 2002/0085864) in view of Kurokawa (US Pat. # 5,873,016) and in further view of Ohata et al. (JP2002193471), hereinafter referred to as Ohata.

Regarding claims 4 and 18, Abe discloses the belt conveyance apparatus as claimed in claims 1 and 15.

Regarding claims 5 and 19, Kurokawa discloses the belt conveyance apparatus as claimed in claim 4, wherein a taper is formed on an end surface of the drive roller

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(36) so that, in an unoperated state, a non-tapered portion of the end surface overlaps a side surface of at least one of the first bead and second bead (65') (See fig. 1B).

Abe and Kurokawa differ from the instant invention by not disclosing "wherein coefficient of friction between an end portion of the drive roller and at least one of the first bead and second bead is set smaller than a coefficient of friction of a center portion of the drive roller and the at least one of the first bead and second bead", as set forth in claims 4 and 18.

Ohata teaches a belt conveyance apparatus, wherein the coefficient of friction between an end portion of a drive roller and a at least one of the first bead and second bead is set smaller than a coefficient of friction of a center portion of drive roller and the at least one of the first bead and second bead (see Figs. 7a and 7b, see also machine translation, par. 0036).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have including the teachings of Ohata in the apparatus of Abe and Kurokawa in order to keep frictional shearing stress low (Ohata et al., machine translation, par. 0036, lines 2-3).

Claims 6 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (US Pub. # 2002/0085864) in view of Kurokawa (US Pat. # 5,873,016), in further view of Ohata (JP2002193471) and in even further view of Kawaishi et al. (JP05306037), hereinafter referred to as Kawaishi.

Regarding claims 6 and 20, Abe, Kurokawa and Ohata teach the belt conveyance apparatus as claimed in claims 5 and 19.

Kurokawa differs from the instant invention by not disclosing wherein an outer diameter of a second rotational member is within a range of 1.0 mm of an outer diameter of a first rotational member, as set forth in claims 6 and 19.

Kawaishi teaches a belt conveyance apparatus, comprising a first rotational member constituting the center portion of the drive roller and a second rotational member constituting the end portion of the drive roller (See Fig. 3), wherein an outer diameter of the second rotational member is within a range of 1.0 mm of an outer diameter of the first rotational member (Machine Translation, par. 0048, lines 14-18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included to optimal range of Kawaishi in the apparatus of Abe, Kurokawa and Ohata in order to prevent weakening of contact pressure (Kawaishi et al., Machine Translation, par. 0048, lines 14-17).

Claims 7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (US Pub. # 2002/0085864) in view of Kurokawa (US 5873016) in further view of Ohata (JP2002193471) and in even further view of Maki (JP04169440).

Regarding claims 7 and 21, Abe, Kurokawa and Ohata et al. teach the belt conveyance apparatus as claimed in claims 5 and 19.

Abe, Kurokawa and Ohata differ from the instant invention by not disclosing wherein a “taper angle of the taper with respect to the end surface of the drive roller is set in a range from 10 degrees to 45 degrees”, as set forth in claims 7 and 21.

Maki teaches a belt conveyance apparatus wherein a taper angle of a taper with respect to the end surface of a roller is set in a range from 10 degrees to 45 degrees (See Figs. 1 and 3a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the taper angle of Maki in the apparatus of Abe, Kurokawa and Ohata in order to prevent the bead from being easily displaced from the belt (Maki, English Abstract, lines 18-19).

Claims 8-10, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (US Pub. # 2002/0085864) in view of Hayakawa et al. (JP2002060085), hereinafter referred to as Hayakawa.

Regarding claims 8 and 22, Abe discloses the belt conveyance apparatus as claimed in claim 1, wherein an axis of the drive roller and an axis of the driven roller are substantially perpendicular to a direction of conveyance of a paper sheet (see Fig. 3A).

Regarding claims 9 and 23, Abe discloses the belt conveyance apparatus as claimed in claim 8, wherein at least one of the first bead and second bead is formed on one side of an inner surface of the conveyance belt so that, in an operated stated, the at least one of the first bead and second bead interferes with a lower one of opposite ends of the driven roller in operation (see Fig. 9).

Regarding claims 10 and 24, Abe discloses the belt conveyance apparatus as claimed in claim 9, wherein a taper is formed on an end surface of the drive roller so that, in an unoperated state, a non-tapered portion of the end surface overlaps a side surface of the at least one of the first bead and second bead (see Fig. 9 and Fig. 3a).

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Abe differs from the instant invention by not disclosing that the axis of the driven roller is inclined with respect to the axis of the drive roller, as set forth in claims 8 and 22.

Hayakawa teaches the axis of a driven roller (61) that is inclined with respect to the axis of a drive roller (62) (Figs. 3, 4a and 4b) (English Abstract, lines 8-19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the teachings of Hayakawa in the apparatus of Abe in order to eliminate looseness and wrinkles on the transfer surface (Hayakawa et al., English Abstract, lines 26-28).

Claims 11 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (US Pub. # 2002/0085864) in view of Hayakawa (JP2002060085) further in view of Maki (JP04169440).

Regarding claims 11 and 25, Abe and Hayakawa disclose the belt conveyance apparatus as claimed in claims 10 and 24.

Abe differs from the instant invention by not disclosing wherein a “taper angle of the taper with respect to the end surface of the drive roller is set in a range from 10 degrees to 45 degrees”, as set forth in claims 11 and 25.

Maki teaches a belt conveyance apparatus wherein a taper angle of a taper with respect to the end surface of a roller is set in a range from 10 degrees to 45 degrees (See Figs. 1 and 3a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the taper angle of Maki in the apparatus of Abe

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and Hayakawa in order to prevent the bead from being easily displaced from the belt (Maki, English Abstract, lines 18-19).

Claims 13 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (US Pub. # 2002/0085864) in view of Omata et al. (US2002/0110392), hereinafter referred to as Omata.

Regarding claims 13 and 27, Abe discloses the belt conveyance apparatus of claims 1 and 15.

Abe differs from the instant invention by not disclosing "wherein a coefficient of friction between the drive roller and the conveyance belt is greater than a coefficient of friction between the driven roller and the conveyance belt", as set forth in claims 13 and 27.

Omata teaches a belt conveyance apparatus wherein a coefficient of friction between a drive roller and a conveyance belt is greater than a coefficient of friction between a driven roller and the conveyance belt (par. 0014; "the surface of the driven roller has a layer whose coefficient of friction is lower than that of the surface of the driving roller").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the teachings of Omata in the apparatus of Abe in order to "prevent generation of a local convex portion as a result of adhesion to foreign matter, such as scattered toner, to the rollers between which the transferring material carrying belt or the intermediate transferring belt is wound and stretched, thereby

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preventing staining of the rear surface of the transfer material due to cleaning defect of the belt, transfer defect, etc.” (Omata et al. par. 0013).

Allowable Subject Matter

Claims 12 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims 1-11, 13-25 and 27-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN D. WALSH whose telephone number is (571)272-2726. The examiner can normally be reached on M-F 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Gray can be reached on 571-272-2119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David M Gray/
Supervisory Patent Examiner,
Art Unit 2852

/Ryan D Walsh/
Examiner, Art Unit 2852